

Remarks

A Change of Correspondence for Applicants' attorney was previously transmitted by facsimile on 5/7/2004.

Claims 10 and 25 were previously canceled. Claim 16 is canceled with this amendment. Claims 1-9, 11-15, 17-24, and 26 remain.

All claims were rejected over U.S. patent 6,686,070 B1 (Futamoto) under either Section 102(e) or Section 103 in combination with one or more additional references.


Futamoto teaches a perpendicular magnetic recording disk with a laminated underlayer and suggests that the individual ferromagnetic layers in the underlayer can have antiparallel magnetization directions. However, only Example 2 (column 8) discloses a laminated underlayer with ferromagnetic layers antiferromagnetically coupled to cause antiparallel magnetization directions of the adjacent ferromagnetic layers. Specifically, Example 2 has nine CoFe ferromagnetic layers, each of the same thickness (10 nm). In example 2 there is no antiferromagnetic layer for exchange-biasing the bottom CoFe layer. Example 2 specifically states that the magnetizations of the adjacent underlayer ferromagnetic layers are antiparallel (column 9, lines 30-31). It would be clear to one skilled in the art that none of the other examples of Futamoto teach antiferromagnetically-coupled ferromagnetic layers in a laminated underlayer because in all of these other examples the nonmagnetic spacer layers have compositions and/or thicknesses that are well-known to be incapable of inducing antiferromagnetic exchange coupling.

Applicants' independent claims 1 and 15 have now been amended to include a feature not taught or suggested by Futamoto, namely that the upper ferromagnetic layer in a laminated underlayer of antiferromagnetically-coupled ferromagnetic layers has a thickness approximately one-half the middle layers. This feature and the problem which it addresses are described in detail in Applicants' specification at page 7, line 10 to page 8, line 2. This feature is especially important when the lowermost layer is exchange-biased to an antiferromagnetic layer, which does not exist in Example 2 of Futamoto.

Futamoto does not teach or suggest this feature, which is now a limitation in Applicants' independent claims, nor does Futamoto suggest the problem that this feature addresses. Thus all of Applicant's pending claims are believed allowable.

Claim 16 has been canceled with the incorporation of its claimed feature into independent claim 15 and the basis for the Section 112 rejection of former claim 16 has now been corrected in the amendment to claim 15.

Respectfully submitted,



Thomas R. Berthold, Attorney for Applicants
Reg. No. 28,689
18938 Congress Junction Ct.
Saratoga, CA 95070-4570
Phone: (408) 396-8411
Fax: (408) 904-6605